

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference WPP86436	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 03/03541	International filing date (day/month/year) 13/08/2003	(Earliest) Priority Date (day/month/year) 13/08/2002
Applicant PHARMA MAR, S.A.U.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 9 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/03541

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07D491/14 C07D471/14 C07D471/04 A61K31/435 A61P35/00
 //(C07D491/14,311:00,221:00,209:00)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07D A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	QUESADA AR ET AL: "Polyaromatic alkaloids from marine invertebrates as cytotoxic compounds and inhibitors of multidrug resistance caused by P-glycoprotein" BRITISH JOURNAL OF CANCER, vol. 74, 1996, pages 677-682, XP009019845 UK tables I,II	19,20
Y	ISHIBASHI F ET AL: "Synthesis and structure-activity relationship study of Lamellarin derivatives" JOURNAL OF NATURAL PRODUCTS, vol. 65, pages 500-504, XP002259136 USA cited in the application tables 1,2	19,20
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the International search

30 October 2003

Date of mailing of the international search report

26/03/2004

Name and mailing address of the ISA

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Bakboord, J

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 97 01336 A (PHARMA MAR SA) 16 January 1997 (1997-01-16) cited in the application claim 1 ---	19,20
Y	RIDLEY CP ET AL: "Total synthesis and evaluation of lamellarin alpha 20-sulfate analogues" BIOORGANIC & MEDICINAL CHEMISTRY, vol. 10, 2002, pages 3285-3290, XP002259137 UK table 1 ---	19,20
A	REDDY MVR ET AL: "Lamellarin alpha 20-sulfate, an inhibitor of HIV-1 Integrase active against HIV-1 Virus in cell culture" JOURNAL OF MEDICINAL CHEMISTRY, vol. 42, 1999, pages 1901-1907, XP002259138 USA cited in the application the whole document ---	19,20
A	DAVIS RA ET AL: "New Lamellarin alkaloids from the Australian Ascidian, Didemnum chartaceum" JOURNAL OF NATURAL PRODUCTS, vol. 62, 1999, pages 419-424, XP002259139 USA cited in the application the whole document ---	1-16
A	HAM J ET AL: "A novel cytotoxic alkaloid of Lamellarin class from a Marine Ascidian Didemnum sp." BULLETIN OF THE KOREAN CHEMICAL SOCIETY, vol. 23, no. 1, 2002, pages 163-166, XP002259140 Korea cited in the application the whole document ---	1-16
A	REDDY MVR ET AL: "New Lamellarin alkaloids from an unidentified Ascidian from the Arabian Sea" TETRAHEDRON, vol. 53, no. 19, 1997, pages 3457-3466, XP002259141 UK cited in the application the whole document ---	1-16

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CANTRELL CL ET AL: "A new staurosporine analog from the prosobranch mollusk <i>coriocella nigra</i> " NATURAL PRODUCT LETTERS, vol. 14, no. 1, 1999, pages 39-46, XP009019851 malaysia the whole document ----	1-16
A	URBAN S ET AL: "Lamellarins O and P: New aromatic metabolites from the Australian marine sponge <i>Dendrilla cactus</i> " AUSTRALIAN JOURNAL OF CHEMISTRY, vol. 47, no. 10, 1994, pages 1919-1924, XP009019823 australia cited in the application the whole document ----	1-16
A	CARROLL A R ET AL: "STUDIES OF AUSTRALIAN ASCIDIANS I SIX NEW LAMELLARIN-CLASS ALKALOIDS FROM A COLONIAL ASCIDIAN, <i>DIDEMNUM SP</i> " AUSTRALIAN JOURNAL OF CHEMISTRY, XX, XX, vol. 46, no. 4, 1993, pages 489-501, XP000602402 ISSN: 0004-9425 cited in the application the whole document ----	1-16
A	LINDQUIST N ET AL: "NEW ALKALOIDS OF THE LAMELLARIN CLASS FROM THE MARINE ASCIDIAN <i>DIDEMNUM CHARTACEUM</i> (SLUITER, 1909)" JOURNAL OF ORGANIC CHEMISTRY, AMERICAN CHEMICAL SOCIETY, EASTON, US, vol. 53, no. 19, 16 September 1988 (1988-09-16), pages 4570-4574, XP000602058 ISSN: 0022-3263 cited in the application the whole document ----	1-16
A	ANDERSEN R J ET AL: "METABOLITES OF THE MARINE PROSOBRANCH MOLLUSC <i>LAMELLARIA SP</i> " JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, DC, US, vol. 107, 1985, pages 5492-5495, XP002218629 ISSN: 0002-7863 cited in the application the whole document ----- -/--	1-16

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>URBAN S ET AL: "LAMELLARIN-S: A NEW AROMATIC METABOLITE FROM AN AUSTRALIAN TUNICATE, DIDEMNUM SP"</p> <p>AUSTRALIAN JOURNAL OF CHEMISTRY, XX, XX, vol. 49, 1996, pages 711-713, XP000872208</p> <p>ISSN: 0004-9425</p> <p>cited in the application</p> <p>the whole document</p>	1-16
A	<p>BANWELL M ET AL: "CONVERGENT TOTAL SYNTHESIS OF LAMELLARIN K"</p> <p>CHEMICAL COMMUNICATIONS, ROYAL SOCIETY OF CHEMISTRY, GB,</p> <p>vol. 23, 1997, pages 2259-2260,</p> <p>XP000867646</p> <p>ISSN: 1359-7345</p> <p>the whole document</p>	1-16
A	<p>WO 98 50365 A (BANWELL MARTIN GERHARDT ;UNIV AUSTRALIAN (AU); FLYNN BERNARD LUKE)</p> <p>12 November 1998 (1998-11-12)</p> <p>cited in the application</p> <p>claim 16</p>	1-16
A	<p>BANWELL MG ET AL: "Assessment of double-barrelled heck cyclizations as a means for construction of the 14-phenyl-8,9-dihydro-6H-1!benzo'4',3':4, 5!pyrrolo'2,1-a!isoquinolin-6-one core associated with certain members of the Lamellarin class of marine natural product"</p> <p>AUSTRALIAN JOURNAL OF CHEMISTRY, vol. 52, 1998, pages 755-765, XP009019850</p> <p>australia</p> <p>the whole document</p>	1-16
A	<p>ISHIBASHI F ET AL: "Total synthesis of lamellarin D and H. The first synthesis of Lamellarin-class marine alkaloids"</p> <p>TETRAHEDRON, vol. 53, no. 17, 1997, pages 5951-5962, XP002259142</p> <p>UK</p> <p>the whole document</p>	1-16
A	<p>DIAZ M ET AL: "syntheses of Lamellarins I and K by '2+3! cycloaddition of a nitrone to an alkyne"</p> <p>SYNLETT, vol. 7, 2001, pages 1164-1166, XP001155819</p> <p>USA</p> <p>cited in the application</p> <p>the whole document</p>	1-16

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 67250 A (BANWELL MARTIN GERHARDT ;UNIV AUSTRALIAN (AU); FLYNN BERNARD LUKE) 29 December 1999 (1999-12-29) cited in the application claim 14 ----	1-16
A	HEIM A ET AL: "BIOMIMETIC SYNTHESIS OF LAMELLARIN G TRIMETHYL ETHER" ANGEWANDTE CHEMIE. INTERNATIONAL EDITION, VERLAG CHEMIE. WEINHEIM, DE, vol. 36, 1997, pages 155-156, XP000867643 ISSN: 0570-0833 cited in the application the whole document ----	1-16
A	RUCHIRAWAT S ET AL: "An efficient synthesis of lamellarin alkaloids: synthesis of lamellarin G trimethyl ether" TETRAHEDRON LETTERS, vol. 42, 2001, pages 1205-1208, XP002259143 UK cited in the application the whole document ----	1-16
P,A	CIRONI P ET AL: "Solid-phase total synthesis of the pentacyclic system Lamellarins U and L" ORGANIC LETTERS, vol. 5, no. 16, 2003, pages 2959-2962, XP002259144 USA cited in the application the whole document ----	1-16
P,A	PLOYPRADITH P ET AL: "Further developments in the synthesis of lamellarin alkaloids via direct metal-halogen exchange" TETRAHEDRON LETTERS, vol. 44, 2003, pages 1363-1366, XP002259145 UK the whole document ----	1-16
P,A	IWAO M ET AL: "Short and flexible route to 3,4-diarylpyrrole marine alkaloids: syntheses of permethyl storniamide A, ningalin B and lamellarin G trimethyl ether" TETRAHEDRON LETTERS, vol. 44, 2003, pages 4443-4446, XP002259146 UK the whole document -----	1-16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/03541

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claim 19 is directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compounds.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/03541

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9701336	A	16-01-1997	US 5852033 A	22-12-1998
			AT 208196 T	15-11-2001
			AU 700420 B2	07-01-1999
			AU 6316796 A	30-01-1997
			CA 2225807 A1	16-01-1997
			DE 69616792 D1	13-12-2001
			DE 69616792 T2	20-06-2002
			DK 835108 T3	18-03-2002
			EP 0835108 A1	15-04-1998
			ES 2164899 T3	01-03-2002
			HU 9900186 A2	28-06-1999
			WO 9701336 A1	16-01-1997
			JP 11508882 T	03-08-1999
			PL 324282 A1	11-05-1998
			PT 835108 T	28-03-2002
			RU 2188637 C2	10-09-2002
			US 6087370 A	11-07-2000
WO 9850365	A	12-11-1998	AU 749165 B2	20-06-2002
			AU 7017098 A	27-11-1998
			WO 9850365 A1	12-11-1998
			CA 2330976 A1	12-11-1998
			CN 1262677 T	09-08-2000
			EP 0981517 A1	01-03-2000
			JP 2002501504 T	15-01-2002
			NZ 501387 A	28-02-2003
			US 6521757 B1	18-02-2003
WO 9967250	A	29-12-1999	AU 755919 B2	02-01-2003
			AU 4590799 A	10-01-2000
			WO 9967250 A1	29-12-1999
			BR 9911559 A	20-03-2001
			CA 2334322 A1	29-12-1999
			CN 1307580 T	08-08-2001
			EP 1090008 A1	11-04-2001
			HU 0102784 A2	28-11-2001
			JP 2002518503 T	25-06-2002
			NZ 508652 A	26-09-2003
			PL 345099 A1	03-12-2001
			US 6469171 B1	22-10-2002